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TO ALL WHOM IT MAY CONCERN:

RULES-BASED NOTIFICATION SYSTEM

Patent Application.doc/40014

CROSS-REFERENCE TO RELATED APPLICATION

1 This application claims the benefit of United States Provisional Application
2 No. 60/158,732, filed October 11, 1999. This application also contains matter in
3 common with copending US application Serial No. 09/686,442, filed on even
4 date herewith, titled CUSTOMIZABLE USER WINDOW, which is incorporated by
5 reference.

BACKGROUND OF THE INVENTION

6 1. Field of the Invention:

7 The present invention relates generally to communications for electronic
8 computer systems, and more specifically to a system and method for notifying a
9 user that selected events have occurred within the system.

10 2. Description of the Prior Art:

11 As computer systems and data communications become increasingly
12 widespread, more and more users are able to perform a high percentage of their
13 daily tasks over various communication networks. For example, many users are
14 able to obtain key information in a timely manner through the use of interconnected
15 software and hardware systems.

1 Because of the great wealth of information available, it often becomes time
2 consuming for a user to keep up with items and events of interest. In some cases,
3 a dedicated window may be included on a user's desktop to provide information
4 about high priority items. For example, a streaming stock quote ticker may be
5 resident on a user's desktop to enable them to keep up with selected stock market
6 information. However, the number and variety of sources of potentially interesting
7 information is so large that this type of dedicated approach can work for only a
8 small number of sources.

9 Often, a user is required to access a database or other source of information
10 in order to determine whether an event of interest has occurred. This can be
11 relatively time consuming, and often results in undesirable delays if the user is
12 unable to check the required sources often enough.

13 Another approach is to automatically send notifications directly from an
14 application to a user when selected events occur. This requires coding of the
15 necessary handling and routing modules within the application. This can become a
16 significant burden from the application writer's standpoint, and can lead to
17 inconsistencies in the way message notifications are presented to users.

18 It would be desirable to provide a system and method for automatically
19 notifying users upon the occurrence of selected events. It would further be
20 desirable for such notification system to be able to handle different types of events
21 and present notifications to users in different ways.

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1 In accordance with the present invention, a system and method for providing
2 notifications to a user includes an alert manager. The alert manager receives
3 notifications of events incurring within various executing applications, and utilizes
4 rules to determine when alert notifications should be sent to one or more specified
5 users. In addition, operation of batch jobs can determine changes in state of
6 selected data, which generate events for the alert manager in addition to those
7 generated directly by an executing application. Alert notifications to users can be
8 sent to the user via any of several communications channels.

BRIEF DESCRIPTION OF THE DRAWINGS

1 The novel features believed characteristic of the invention are set forth in the
2 appended claims. The invention itself however, as well as a preferred mode of use,
3 further objects and advantages thereof, will best be understood by reference to the
4 following detailed description of an illustrative embodiment when read in
5 conjunction with the accompanying drawings, wherein:

6 Figure 1 is a high-level block diagram of a system in accordance with the
7 present invention;

8 Figure 2 is a block diagram indicating additional details of the system of
9 Figure 1;

10 Figures 3A and 3B illustrate operation of different types of event generation
11 techniques;

12 Figure 4 shows the type of information maintained by an event router in
13 accordance with the present invention;

14 Figure 5 is a block diagram illustrating an operation of an alert manager;

15 Figure 6A illustrates one preferred embodiment for using a rule filter with
16 event handlers; and

DESCRIPTION OF THE PREFERRED EMBODIMENT

As will be understood by those skilled in the art, the present system and method can be used with nearly any computer system in which events occur during execution of an application, or in which data is changed. In the preferred embodiment, the operating applications are of a type which generate messages indicating the occurrence of selected events. However, as described below, the system will also work with applications which do not generate such events, and is adaptable to nearly any type of computer application.

Referring to Figure 1, a preferred embodiment of the inventive system and method is illustrated generally as reference number 10. A plurality of applications 12 operate concurrently, and may be located on a single piece of hardware, or spread among numerous machines. The applications 12 need not operate in conjunction with one another, but may be a wide variety of selected applications, of any type, which perform data processing functions.

As will be described in more detail in connection with Figure 2, applications 12 generate events 14, which are forwarded to an event router 16. Events 14 are basically messages indicating that some type of predetermined event has occurred. As defined further in connection with Figure 2, these messages may be generated directly by applications to indicate that an event has occurred in that application. For example, an application which is used to change the price of a product in a

1 handlers 20 are generally any applications which make some use of the information
2 provided by incoming event messages 18.

3 ~~Some events 22 are routed to an alert manager 24, which is a particular type~~
4 ~~of event handler. As described further in connection with the remaining figures,~~
5 ~~alert manager 24 handles incoming events by determining whether any incoming~~
6 ~~event requires that a notification, or alert 26, to be forwarded to a user 28. Alert~~
7 ~~manager 24 utilizes a set of rules to determine to whom, and when, notifications~~
8 ~~should be made to a user 28.~~

9 Referring to Figure 2, the types of applications 12 which generate events
10 may be classified generally into two categories. The first category is referred to
11 herein as business objects 30, which may include within them state machines 32
12 and similar operating modules. Business objects 30 generate "explicit" events,
13 meaning that the code of the business object application explicitly generates an
14 event to be sent to event router 16 as events occur. This capability must be
15 programmed into business objects 30 and their state machines 32.

16 Explicit events are useful, in the present invention, for indicating when a
17 single event has occurred. For example, when a sale is made, or a product
18 changes price, or a new product becomes available, if the corresponding business
19 objects are properly programmed events will be generated. These can be picked
20 up by alert manager 24, and used to generate notifications.

1 can also include sending of a message via phone, pager, fax, or any other desired
 2 technique. The contents of the message are defined by the notification portion of
 3 the rule. Preferably, a fairly large number of preselected message types will be
 4 available, so that a user will be able to select from these messages. The messages
 5 can include textual information, and can include as parameters some or all of the
 6 context information included with event 64. In the example of Figure 5, an e-mail
 7 message can be sent to the user who registered Rule 1 indicating that a price
 8 change for BOAT has occurred, and indicating the new price for the BOAT. A call
 9 can be made to a pager at the same time; any desired number of notifications can
 10 be made.

11 This rule base system allows users to register with the alert manager 24,
 12 defining logical conditions under which alerts of various types will be sent. This
 13 frees the user from having to check for events or changed conditions individually;
 14 this is done automatically by the rules set up in the alert manager. Users can
 15 determine how these messages are to be sent. E-mail would be one typical type of
 16 message; users may also provide for one or more notification windows to be
 17 generated upon their desktop for the sole purpose of receiving alert notifications.

18 By setting up and registering different types of alerts with a central system, a
 19 user can be notified regarding a wide variety of events which would otherwise take
 20 too much time and effort to profitably be viewed. Upon receiving one of these
 21 alerts, the user can, if she so desires, take a corresponding action.

1 Users gain the ability to select types of events for which they wish to be
2 notified. When these events occur, notification occurs automatically. The user
3 need not periodically review various locations to determine whether anything has
4 happened. Users can select from among types of events, and the applications
5 writers can determine which events to actually make available. For example, a
6 user can register with the alert manager 24 to be notified whenever a new product
7 is introduced by a competitor; automatic notifications will be provided whenever this
8 occurs, assuming the events are available as either explicit or implicit events.

9 Preferably, users will be able to select from one or more menus of choices
10 provided by the system. This simplifies the task of registering to receive alerts, and
11 ensures a certain uniformity of notifications across all users. The conditionals used
12 in the alert rules can be provided as templates, with the user selecting the form of
13 the conditional and any particular values to be used. In this manner, the user can
14 easily provide a set of alert rules to meet his or her needs.

15 *Sub A* As described previously, the alert notifications themselves can be provided
16 in any available format supported by the system. Notification may be by e-mail or
17 other electronic messaging as known in the art. By sending appropriate messages
18 to any type of intermediate interface devices, messages such as pages or
19 telephone alerts can also be made. Because the alert notification message and its
20 type are maintained in tables in the alert manager, addition of a new technology is
21 easily made to the alert system. All that is necessary is to provide that a selected
22 message be sent to an appropriate handler from the alert manager, and the
23 message can be sent to the registered user.

1 While the invention has been particularly shown and described with
2 reference to a preferred embodiment, it will be understood by those skilled in the art
3 that various changes in form and detail may be made therein without departing from
4 the spirit and scope of the invention.

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